Contents

No. 1 (February 1970)

PAGE

ORIGINAL ARTICLES

Observed ratios of $^{90}Sr/Ca$ and $^{137}Cs/K$ in the food of nursing mothers and in their milk. G. G. CALAPAJ and D. ONGARO 1

Utilization of citrate by lactobacilli isolated from dairy products. T. F. FRYER 9

Utilization of milk citrate by lactic acid bacteria and 'blowing' of film-wrapped cheese. T. F. FRYER, M. ELISABETH SHARPE and B. REITER . 17

Observations on the use of 2,4-dinitrophenylhydrazine and of 2,6-dichlorophenolindophenol for the determination of vitamin C in raw and in heat-treated milk. JOYCE TOOTHILL, S. Y. THOMPSON and J. EDWARDS-WEBB 29

Association of lipases with micellar and soluble casein complexes. W. K. DOWNEY and R. F. MURPHY 47

A technique for studying the build-up and prevention of milk film on hard surfaces. L. F. L. CLEGG and CHRISTINA M. COUSINS 61

Studies on the mechanism of the Whiteside mastitis test reaction. G. NAGESWARARAO and J. B. DERBYSHIRE 77

The pattern of release of free fatty acids from milk fat under the action of intrinsic and added lipases. E. B. HEMINGWAY, G. H. SMITH and J. A. F. ROOK 83

The digestion of fatty acids in the stomach and intestines of sheep given widely different rations. J. D. SUTTON, J. E. STORRY and J. W. G. NICHOLSON 97

Determination of moisture in dairy products by near infra-red absorption of methanol extracts. J. D. S. GOULDEN and D. J. MANNING 107

Carbohydrate analysis of the glycopeptides released by the action of rennin on whole milk. G. SINKINSON and J. V. WHEELOCK 113

Fractionation of bovine serum lipoproteins and their characterization by gradient gel electrophoresis. P. E. BRUMBY and V. A. WELCH . . 121

The estimation of diacetyl in the presence of other carbonyl compounds. G. J. LEES and G. R. JAGO 129

The detection of clinical mastitis with in-line filters. J. B. HOYLE and F. H. DODD 133

Reviews of the progress of Dairy Science. Section A. Physiology. Ruminant metabolism in relation to the synthesis and secretion of milk fat. J. E. STORRY 139

No. 2 (June 1970)

PAGE

ORIGINAL ARTICLES

A rapid bioassay for penicillin residues in milk. T. M. COGAN and P. F. FOX 165

Influence of aggregation on the susceptibility of casein to proteolysis. P. F. FOX 173

The effect of the periodic feeding of linseed oil on the production and iodine value of milk fat. J. C. WADSWORTH 181

The effect of the modification of arginine side chains in casein on the coagulation of rennin-altered casein. R. D. HILL 187

The effects of intravenous infusions of insulin and of sodium succinate on milk secretion in the goat. J. A. F. ROOK and J. B. HOPWOOD . . 193

Extraction of the 260 nm-absorbing material from group N streptococci as a method for estimating cell growth. D. McC. HOGG and G. R. JAGO . . 199

Measurement of the quantity of lactose passing into mammary venous plasma and lymph in goats and in a cow. N. J. KUHN and J. L. LINZELL . 203

Comparison of milks processed by the direct and indirect methods of ultra-high-temperature sterilization. I. An experimental ultra-high-temperature sterilizer and its characteristics. H. BURTON and A. G. PERKIN . . 209

Comparison of milks processed by the direct and indirect methods of ultra-high-temperature sterilization. II. The sporicidal efficiency of an experimental plant for direct and indirect processing. J. G. FRANKLIN, H. M. UNDERWOOD, A. G. PERKIN and H. BURTON 219

Comparison of milks processed by the direct and indirect methods of ultra-high-temperature sterilization. III. A note on the results for spore destruction obtained with an experimental ultra-high-temperature milk sterilizer. H. BURTON 227

The denaturation of α-lactalbumin and β-lactoglobulin in heated milk. R. L. J. LYSTER 233

The interaction of bovine milk caseins with the detergent sodium dodecyl sulphate. I. The relationship between the composition and the size of the protein–detergent aggregate. G. C. CHEESEMAN and JOAN JEFFCOAT . 245

The interaction of bovine milk caseins with the detergent sodium dodecyl sulphate. II. The effect of detergent binding on spectral properties of caseins. G. C. CHEESEMAN and DOROTHY J. KNIGHT 259

Structure of the casein micelle. The accessibility of the subunits to various reagents. B. RIBADEAU DUMAS and J. GARNIER 269

Milk enzymes—their distribution and activity. B. J. KITCHEN, G. C. TAYLOR and I. C. WHITE 279

Apparatus and milking techniques used in lactation studies with sheep. T. T. TREACHER 289

PAGE

The composition of ewe's milk fat during early and late lactation. R. C. NOBLE, W. STEELE and J. H. MOORE 297

Reviews of the progress of Dairy Science. Section E. Diseases of dairy cattle. Brucellosis. W. J. BRINLEY MORGAN 303

No. 3 (October 1970)

ORIGINAL ARTICLES

The temperature-dependent dissociation of β-casein from bovine casein micelles and complexes. W. K. DOWNEY and R. F. MURPHY . . 361

Metabolism of [1^{-14}C]palmitate and [1^{-14}C]oleate by the isolated perfused mammary gland of the sheep or goat. ANNE-MARIE MASSART-LËEN, S. FLORESCU, R. VERBEKE and G. PEETERS 373

The primary phase of rennin action in heat-sterilized milk. E. J. HINDLE and J. V. WHEELOCK 389

The release of peptides and glycopeptides by the action of heat on cow's milk. E. J. HINDLE and J. V. WHEELOCK 397

Low resolution nuclear magnetic resonance in the determination of moisture in cheese curd. N. J. BERRIDGE, ELIZABETH CREAN and P. B. MANSFIELD 407

The influence of various treatments on the drainage of continuously made curd. N. J. BERRIDGE with the technical assistance of P. G. SCURLOCK 417

Composition of the bound lipids in caseins and in ripening cheeses. V. BOLCATO, P. SPETTOLI and A. CAGLIARI. 431

The tertiary phase of rennin action on α_s and β-caseins. A. M. EL-NEGOUMY 437

The effect of fatty acids on the metabolism of pyruvate in lactic acid streptococci. R. F. ANDERS and G. R. JAGO 445

The inactivation of lactoperoxidase by group N streptococci. D. McC. HOGG and G. R. JAGO 457

Nutritional deficiencies of co-precipitate for the growth of a strain of *Lactobacillus acidophilus*. BARBARA P. KEOGH 461

Announcement. Electronic counting of somatic cells in milk 465

A study of methods for estimating the cell content of bulk milk. J. K. L. PEARSON, C. L. WRIGHT and D. O. GREER 467

The associative effect of level of energy and protein intake in the dairy cow. F. J. GORDON and T. J. FORBES 481

Structure of the casein micelle. A proposed model. J. GARNIER and B. RIBADEAU DUMAS 493

An improved method for canning 3-fold concentrated whole milk. P. W. BOARD and J. T. MULLETT 505

PAGE

Structural changes in whole milk during the production of sterile concentrates: an electron microscope study. P. W. Board, Joan M. Bain, D. W. Gove and J. T. Mullett 513

The determination of vitamin C in evaporated and fortified sterilized milks. Joyce Toothill, S. Y. Thompson and W. B. Hill 521

Comparison of milks processed by the direct and indirect methods of ultra-high-temperature sterilization. IV. The vitamin composition of milks sterilized by different processes. H. Burton, J. E. Ford, A. G. Perkin, J. W. G. Porter, K. J. Scott, S. Y. Thompson, Joyce Toothill and J. D. Edwards-Webb 529

A comparison of the milking characteristics of transparent and conventional teatcup liners. G. A. Mein, P. A. Clough, D. R. Westgarth and C. C. Thiel 535

Index of Subjects

Antibiotic, *see* **Penicillin**

Blood, plasma, lactose content, lactating-goats, -cow, 203
serum, lipoproteins, fractionation, 121
Brucellosis (review), 303

Caesium, $^{137}Cs/K$ ratio, human milk, 1
Canning, 3-fold concentrated milk, 505
Casein(s), bound lipids, composition, 431
coagulation, role of arginine, 187
interaction with detergents, 245, 259
micelles, soluble complexes, β-casein dissociation, temperature-dependent, 361
lipase association, 47
structure, proposed model, 493
study, technique, limited proteolysis, 173
subunits, distribution, 269
proteolysis, 173
rennin, action on, 187, 437
α_s-Casein, action of rennin, tertiary phase, 437
β-Casein, action of rennin, tertiary phase, 437
temperature-dependent dissociation from casein-micelles, -complexes, 361
Cheese, film-wrapped, 'blowing', 17
ripening, bound lipids, composition, 431
Cheesemaking, continuous curd-making, drainage, conditions necessary, 417
curd, moisture determination, nuclear magnetic resonance, 407
starter, *see* **Starters**, cheese
Co-precipitate, growth medium, *Lactobacillus acidophilus*, 461

Dairy products, lactobacilli, citrate utilization, 9, 17
moisture determination, 107
Detergents, disinfectants, mixtures, prevention, milk film, hard surfaces, 61
interaction with caseins, 245, 259
Diacetyl, estimation, 129
Diet, energy-, protein-intake, milk yield and composition, 481
high-, low-roughage content, fatty acids, stomach, intestines, sheep, 97
milk fat secretion (review), 139
Diseases, *see* **Brucellosis, Mastitis**
Disinfectants, detergents, mixtures, prevention, milk film, hard surfaces, 61

Energy, intake, milk yield and composition, 481
Enzymes, *see also* **Lactoperoxidase, Lipase, Rennin**
distribution, activity, milk, 279

Fatty acids, composition, milk fat, early-, late-lactation, ewes, 297
in stomach, intestines, sheep, fed high-, low-roughage diet, 97
metabolism, perfused mammary gland, 373
pyruvate metabolism, lactic acid streptococci, 445
release, milk fat, lipase taint, 83
Flavour, lipase taint, milk, 83

Glycopeptides, released, milk, action, rennin, carbohydrate analysis, 113
heat treatment, 397
Goats, lactating, lactose content, plasma, lymph, 203
milk secretion, intravenous infusion, insulin, sodium succinate, 193

Heat treatment, *see also* **Sterilization**
milk, peptides, glycopeptides, release, 397
whey proteins, denaturation, 233
Human milk, radioactivity, $^{90}Sr/Ca$, $^{137}Cs/K$ ratios, 1

Infant feeding, human milk, $^{90}Sr/Ca$, $^{137}Cs/K$ ratios, 1
Insulin, intravenous infusion, milk secretion, goats, 193
Iodine value, milk fat, feeding linseed oil, 181

α-Lactalbumin, skim-milk, heat denaturation, 233
Lactation, *see also* **Milk secretion**
ewes, 289, 297
Lactic acid bacteria, *see* **Lactobacilli, Streptococci**
Lactobacilli, citrate utilization, dairy products, 9, 17
Lactobacillus acidophilus, co-precipitate as growth medium, 461
β-Lactoglobulin, skim-milk, heat denaturation, 233
Lactoperoxidase, inactivation by Group N streptococci, 457
Lactose, content, milk, intravenous infusion, insulin, sodium succinate, goats, 193
plasma, lymph, lactating-goats, -cow, 203
Linseed oil, fed, milk fat, iodine value, 181
Lipase, association, micellar-, soluble-casein complexes, 47
taint, free fatty acids, release, 83
Lipids, bound, composition, caseins, ripening cheeses, 431
Lipoproteins, blood serum, fractionation, 121
Lymph, lactose content, lactating-goats, -cow, 203

Mammary gland, perfused, free fatty acid metabolism, 373
Mastitis, detection, cell counts, methods, 465, 467
in-line filters, 133
Whiteside test reaction, mechanism, 77
ewes, machine-milked, 289
Milk, action of rennin, glycopeptides, carbohydrate analysis, 113
when heat-sterilized, 389
cell counts, methods, 467
Coulter counter, leaflet, 465
concentrated, 3-fold, canning, 505
preparation, structural changes, electron microscope study, 513
enzymes, distribution, activity, 279
lipase-casein complexes, 47
penicillin residues, bioassay, 165
vitamins, content, direct, indirect, UHT sterilization, 529
C, determination, evaporated, fortified sterilized, 521
raw, heat-treated, 29
Milk composition, ewes, 289
goats, intravenous infusion, insulin, sodium succinate, 193
level of energy-, protein-intake, 481
Milk deposits, hard surfaces, technique, study, prevention, 61
Milk fat, content, fatty acids, composition, ewes, early-, late-lactation, 297
fatty acids, release, lipases, 83
iodine value, feeding linseed oil, 181
secretion (review), 139
Milk fat yield, intravenous infusion, insulin, sodium succinate, goats, 193
Milk proteins, yield, intravenous infusion, insulin, sodium succinate, goats, 193
Milk sampling, bulk milk, cell counts, methods, 465, 467
Milk yield, intravenous infusion, insulin, sodium succinate, goats, 193
level of energy-, protein-intake, 481
non-nutritional factors, ewes, 289
Milking machines, lactation studies, ewes, 289
teatcup liners, transparent, conventional, milking characteristics, 535
Moisture, determination, dairy products, 107

Nuclear magnetic resonance, moisture determination, cheese curd, 407

Penicillin, residues, milk, bioassay, 165
Peptides, released, milk, heat treatment, 397
Proteins, *see also* **Milk proteins**
intake, milk yield and composition, 481
whey, *see* **Whey proteins**
Proteolysis, casein, 173

Radioactivity, $^{90}Sr/Ca$, $^{137}Cs/K$ ratios, human milk, 1
Rennin, action, casein, role of arginine, 187
α_s-, β-caseins, tertiary phase, 437
milk, glycopeptides, carbohydrate analysis, 113
heat-sterilized, 389
Sheep, fatty acid content, stomach, intestines, high-, low-roughage diet, 97
lactation studies, machine milking, 289
milk fat, content, fatty acids, composition, early-, late-lactation, 297
Starters, cheese, gas production, 17
Sterilization, UHT, milk, direct, indirect, comparison, 209, 219, 227
vitamin content, 529
rennin, action, 389
Streptococci, Group N, citrate utilization, milk, 17
growth, in milk, estimation, 199
lactoperoxidase, inactivatio , 457
pyruvate metabolism, effect of fatty acids, 445
Streptococcus thermophilus, detection, penicillin residues, milk, 165
Strontium, $^{90}Sr/Ca$ ratio, human milk, 1
Succinate, intravenous infusion, milk secretion, goat, 193

Vitamin C, determination, milk, evaporated, fortified sterilized, 521
raw, heat-treated, 29
Vitamins, content, milk, direct, indirect UHT sterilization, 529

Whey proteins, skim-milk, heat denaturation, 233

Index of Authors

Anders, R. F., 445

Bain, Joan M., 513
Berridge, N. J., 407, 417
Board, P. W., 505, 513
Bolcato, V., 431
Brumby, P. E., 121
Burton, H., 209, 219, 227, 529

Cagliari, A., 431
Calapaj, G. G., 1
Cheeseman, G. C., 245, 259
Clegg, L. F. L., 61
Clough, P. A., 535
Cogan, T. M., 165
Cousins, Christina M., 61
Crean, Elizabeth, 407

Derbyshire, J. B., 77
Dodd, F. H., 133
Downey, W. K., 47, 361

Edwards-Webb, J. D., 29, 529
El-Negoumy, A. M., 437

Florescu, S., 373
Forbes, T. J., 481
Ford, J. E., 529
Fox, P. F., 165, 173
Franklin, J. G., 219
Fryer, T. F., 9, 17

Garnier, J., 269, 493
Gordon, F. J., 481
Goulden, J. D. S., 107
Gove, D. W., 513
Greer, D. O., 467

Hemingway, E. B., 83
Hill, R. D., 187
Hill, W. B., 521
Hindle, E. J., 389, 397
Hogg, D. McC., 199, 457
Hopwood, J. B., 193
Hoyle, J. B., 133

Jago, G. R., 129, 199, 445, 457
Jeffcoat, Joan, 245

Keogh, Barbara P., 461
Kitchen, B. J., 279
Knight, Dorothy J., 259
Kuhn, N. J., 203

Lees, G. J., 129
Linzell, J. L., 203
Lyster, R. L. J., 233

Manning, D. J., 107
Mansfield, P. B., 407
Massart-Leën, Anne-Marie, 373
Mein, G. A., 535
Moore, J. H., 297
Morgan, W. J. Brinley, 303
Mullett, J. T., 505, 513
Murphy, R. F., 47, 361

Nageswararao, G., 77
Nicholson, J. W. G., 97
Noble, R. C., 297

Ongaro, D., 1

Pearson, J. K. L., 467
Peeters, G., 373
Perkin, A. G., 209, 219, 529
Porter, J. W. G., 529

Reiter, B., 17
Ribadeau Dumas, B., 269, 493
Rook, J. A. F., 83, 193

Scott, K. J., 529
Scurlock, P. G., 417
Sharpe, M., Elisabeth 17
Sinkinson, G., 113
Smith, G. H., 83
Spettoli, P., 431
Steele, W., 297
Storry, J. E., 97, 139
Sutton, J. D., 97

Taylor, G. C., 279
Thiel, C. C., 535
Thompson, S. Y., 29, 521, 529
Toothill, Joyce, 29, 521, 529
Treacher, T. T., 289

Underwood, H. M., 219

Verbeke, R., 373

Wadsworth, J. C., 181
Welch, V. A., 121
Westgarth, D. R., 535
Wheelock, J. V., 113, 389, 397
White, I. C., 279
Wright, C. L., 467